

SmartSwitch 9000
9A426-01/9A426-02
Local Management Appendix

9A426-01/9A426-02 Module Specific Information

Introduction

This appendix contains local management information that is specific to the following ATM Modules:

- 9A426-01 (1 active front panel port; 1 stand-by front panel port)
- 9A426-02 (2 active front panel ports)

Local Management Screens

The screens shown in this appendix are for the 9A426-02 ATM Module. The screens for the 9A426-01 ATM Module differ in that there is no Port # field, since the 9A426-01 ATM Module has only one active front panel port.

Module Interfaces

The 9A426-01 ATM Module has seven interfaces. Table 1 lists the identifying number, name, and description of each interface.

Table 1. 9A426-01 ATM Module Interfaces

Interface Number	Interface Name	Interface Description
1	SMB-1	1 Mbps System Management Bus
2	SMB-10	10 Mbps System Management Bus
3	HOST 1	i960 Interface to SmartSwitch Core
4	HOST 2	i960 Interface to SmartSwitch Core
5	INB	Internal Network Bus
6	ATM-1	ATM Front Panel Port 1 (APIM)
7	FNB	Flexible Network Bus

The 9A426-02 ATM Module has eight interfaces. Table 2 lists the identifying number, name, and description of each interface.

Table 2. 9A426-02 ATM Module Interfaces

Interface Number	Interface Name	Interface Description
1	SMB-1	1 Mbps System Management Bus
2	SMB-10	10 Mbps System Management Bus
3	HOST 1	i960 Interface to SmartSwitch Core
4	HOST 2	i960 Interface to SmartSwitch Core
5	INB	Internal Network Bus
6	ATM-1	ATM Front Panel Port 1 (APIM)
7	ATM-2	ATM Front Panel Port 2 (APIM)
8	FNB	Flexible Network Bus

Use the numbers in Table 1 or Table 2 to configure your module's default interface (see the General Configuration Screen).

Modifying Fields and User Privileges

To modify fields on these modules, you must have read-write or super-user privileges. If you have read-only privileges, you can view information; however, you cannot modify any fields.

Virtual Channels and Virtual Paths

Rather than addressing cells to a specific destination, as in a LAN, ATM addresses cells to Virtual Channels (VCs) and/or Virtual Paths (VPs). This addressing takes place in the header field of the ATM cell.

VCs and VPs are bi-directional (i.e., they transfer information in both directions on a single channel or path) and are “set up” between devices on the ATM network prior to transmission. Similar to WAN transmission, ATM technology provides the ability of sending several VCs together over a VP, and several VPs over an ATM link segment.

Permanent and Switched Virtual Channels

ATM networks use two different types of Virtual Channels:

- Permanent Virtual Channels (PVCs)
- Switched Virtual Channels (SVCs).

The difference between PVCs and SVCs exists in the channel setup.

PVCs are pre-configured by an administration function, and are usually established for long-term use. After setting up this channel, nothing else is required by the network to transfer information between the two established points. This type of virtual channelling is established through a local or remote management interface.

SVCs use a signaling and network switching procedure to set up dynamically. In other words, SVCs are established “on the fly,” as needed for a particular service, used to transmit on the short term, and then terminated.

FNB Resource Configuration Screen

The 9A426-01/9A426-02 FNB Resource Configuration Screen (Figure 1), lists all possible connections a module can support on the FNB, displays the current connection, and allows you to change the connection.

```
SmartSwitch 9000 Local Management

FNB Resource Configuration

Module Name: 9A426-02           Firmware Revision: 01.00.01
Slot Number: 5                 BOOTPROM Revision: 01.01.01

Current FDDI Con: (#2) FNB1<->ATM

Config ID      FDDI Connections
1              NORING<->ATM
2              FNB1<->ATM
3              FNB2<->ATM

SAVE                               EXIT                               RETURN
```

Figure 1. 9A426-01/9A426-02 FNB Resource Configuration Screen

FNB Resource Configuration Screen Fields

The following information briefly explains each FNB Resource Configuration Screen field.

Current FDDI Con:

Displays the current connections of the selected module to the SmartSwitch 9000 FNB.

Config ID

Displays an identification number that is automatically assigned to each configuration.

FDDI Connections

Displays all possible connections of the selected module to the SmartSwitch 9000 FNB.

Changing the Current FNB Connection

To change the current FNB connection:

1. Use the arrow keys to highlight the desired FDDI connection.
2. Press the **Return** key.
3. The connection you selected appears in the **Current FDDI Con:** field.
4. Use the arrow keys to highlight **SAVE**, then press the **Return** key.

The message "SAVED OK" appears. This message indicates that the FNB connection you selected has been implemented. If you exit without saving, the message "NOT SAVED -- PRESS SAVE TO KEEP CHANGES" appears, and the FNB connection you selected will not be implemented.

5. Use the arrow keys to highlight **RETURN**, then press the **Return** key.

Connection Table Screen

The 9A426-01/9A426-02 Connection Table Screen (Figure 2), displays the currently configured connections on the module.

```
SmartSwitch 9000 Local Management
9A426-02 Connection Table
Module Name: 9A426-02          Firmware Revision: 01.00.01
Slot Number: 5                BOOTPROM Revision: 01.01.01
ATM Port Current Connections: 2 ELAN:
      VPI   VCI   Encapsulation Type   AAL Type
      0     0005  Other                 5
      0     0016  Other                 5
ELAN:
PORT #: 1                      ADD/DELETE
                                EXIT   ENTRY  RETURN
```

Figure 2. 9A426-01/9A426-02 Connection Table Screen

Connection Table Screen Fields

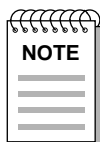
The following information briefly explains each Connection Table Screen field.

ATM Port Current Connections

Number of virtual circuits that are currently open for this port.

ELAN:

Name of the ELAN to which this client is joined.



For more detailed information about this field, see the description for the ELAN Name: field on page 13.

VPI

Displays the Virtual Path Identifier number of the listed PVC or SVC.

VCI

Displays the Virtual Channel Identifier number of the listed PVC or SVC.

Encapsulation Type

Displays the method used to encapsulate data at the ATM Adaptation Layer 5 (AAL5) for each connection. The 9A426-01 and 9A426-02 ATM Modules support the following methods of encapsulation:

- **VC Mux 802.3 LANE (default)**
VC Based Multiplexed 802.3 LAN Emulation. This is the encapsulation type used when the connection is set up via SVCs. These happen automatically in the network with no user intervention.
- **VC Mux Bridged 802.3**
VC Based Multiplexing for bridged protocols. You can choose this encapsulation type for PVCs to do bridging.

- **LLC Encapsulation**
Logical Link Control for Bridged Protocols. You can choose this encapsulation type for PVCs. You cannot use this encapsulation type for SVCs.

LLC Encapsulation inserts an LLC SNAP header for each legacy LAN network type that is being encapsulated onto ATM. LLC Encapsulation is desirable when it is not feasible for a larger number of VCs to be supported, due to ATM device capacity limitations or other outside factors.

- **Other**
This encapsulation type is for reserved connections that are defaults built into most (if not all) ATM LANE 1.0 compliant devices. In other words, they are neither configured by hand nor set up dynamically.

AAL Type

Displays the type of ATM adaptation layer (AAL) used on this VCC. The AAL divides the user information into segments suitable for packaging into series of ATM cells. The AAL types are:

- AAL3/4
- AAL5 (**default**)

ELAN: (Modifiable)

Selects the ELAN for which connections are to be displayed.

To select another ELAN, use the arrow keys to highlight the **ELAN:** field (bottom left corner of the screen), then press the **Space Bar**.

PORT #: (Toggle)

Selects a specific ATM port.

To select another port (if applicable), use the arrow keys to highlight the **PORT #:** field (bottom left corner of the screen), then press the **Space Bar**.

Displaying the Add/Delete Entry Screen

To display the Add/Delete Entry Screen, use the arrow keys to highlight **ADD/DELETE ENTRY**, then press the **Return** key.

Add/Delete Entry Screen

The 9A426-01/9A426-02 Add/Delete Entry Screen (Figure 3), is used to add or delete a PVC on the module.

```
SmartSwitch 9000 Local Management

          9A426-02 ADD/DELETE ENTRY

Module Name: 9A426-02          Firmware Revision: 01.00.01
Slot Number: 5                BOOTPROM Revision: 01.01.01

ATM Port Current Connections:  2 ELAN:

      VPI      VCI      AAL Type      Encapsulation Type
              [ ]      [ ]

ADD          DELETE          EXIT          RETURN
```

Figure 3. 9A426-01/9A426-02 Add/Delete Entry Screen

Add/Delete Entry Screen Fields

The following information briefly explains each Add/Delete Entry Screen field.

VPI

Displays the Virtual Path Identifier number of the connection you want to add or delete.

VCI

Displays the Virtual Channel Identifier number of the connection you want to add or delete.

AAL Type (Toggle)

Displays the types of ATM adaptation layer used on this VCC. Use the **Space Bar** to select one of the following choices:

- AAL3/4
- AAL5 (**default**)

Encapsulation Type (Toggle)

Displays the methods used to encapsulate data at the ATM Adaptation Layer 5 (AAL5) for each connection. The 9A426-01/9A426-02 modules support the following methods of encapsulation:

- **VC Mux 802.3 LANE (default)**
VC Based Multiplexed 802.3 LAN Emulation. This is the encapsulation type used when the connection is set up via SVCs. These happen automatically in the network with no user intervention.
- **VC Mux Bridged 802.3**
VC Based Multiplexing for bridged protocols. You can choose this encapsulation type for PVCs to do bridging.
- **LLC Encapsulation**
Logical Link Control for Bridged Protocols. You can choose this encapsulation type for PVCs. You cannot use this encapsulation type for SVCs.

LLC Encapsulation inserts an LLC SNAP header for each legacy LAN network type that is being encapsulated onto ATM. LLC Encapsulation is desirable when it is not feasible for a larger number of VCs to be supported, due to ATM device capacity limitations or other outside factors.
- **Other**
This encapsulation type is for reserved connections that are defaults built into most (if not all) ATM LANE 1.0 compliant devices. In other words, they are neither configured by hand nor set up dynamically.

Adding PVCs to the Connection Table

To add a PVC to the Connection Table:

1. Go to the Add/Delete Entry Screen.
2. Use the arrow keys to move the cursor to the VPI field.
3. Enter the number of the VPI you want to add, then press the **Tab** key.
4. Enter the number of the VCI you want to add, then press the **Tab** key.
5. Press the **Space Bar** to select the AAL type.
6. Press the **Tab** key.
7. Press the **Space Bar** to select the Encapsulation Type.
8. Use the arrow keys to highlight **ADD**, then press the **Return** key.

The message "ENTRY ADDED" is displayed.

Deleting PVCs From the Connection Table

To delete a PVC from the Connection Table:

1. Go to the Add/Delete Entry Screen.
2. Use the arrow keys to move the cursor to the VPI field.
3. Enter the number of the VPI you want to delete, then press the **Tab** key.
4. Enter the number of the VCI you want to delete, then press the **Tab** key.
5. Use the arrow keys to highlight **DELETE**, then press the **Return** key.

The message "ENTRY DELETED" is displayed.

LEC Administration Screen

The 9A426-01/9A426-02 LEC Administration Screen (Figure 4), is used to add, delete, modify, or view LAN Emulation attributes on the module.

```
SmartSwitch 9000 Local Management

          9A426-02 LEC Administration

Module Name: 9A426-02          Firmware Revision: 01.00.01
Slot Number: 5                BOOTPROM Revision: 01.01.01

Configure LEC: [Automatic]

          ELAN Name:

          Max MTU Size: [1516]

          LAN Type: [802.3]

LES ATM Address: 0000000000000000000000000000000000000000

          ELAN:
SAVE  PORT #: 1  MODIFY  CREATE  DELETE  EXIT  RETURN
```

Figure 4. 9A426-01/9A426-02 LEC Administration Screen

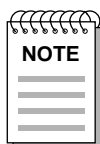
LEC Administration Screen Fields

The following information briefly explains each LEC Administration Screen field.

Configure LEC (Toggle)

Specifies whether the LAN Emulation Client should auto-configure the next time it is started. Use the **Space Bar** to select one of the following choices:

- **Automatic (default)** - A client uses a LAN Emulation Configuration Server (LECS) to learn the ATM address of its LAN Emulation Server and to obtain other parameters.
- **Manually** - Management tells the client the ATM address of its LAN Emulation Server (LES) and the values of other parameters.



If you set Configure LEC to Automatic, do not write to any other attribute on the LEC Administration screen.

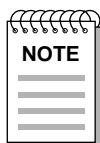
ELAN Name

The name of the ELAN to which this client is joined.

By default, the unit makes a LANE join request to the ATM network with the ELAN name blank (no entry). By popular LANE convention, Join Requests of this type will put that client into the first configured ELAN on the LECS (also known as the “default ELAN”). Assume this ELAN is named “ELAN1”. Once the device has successfully completed the Join process, all ATM-specific Local Management screens will then reflect “ELAN: ELAN1”. This means that all Local Management screen information pertains to the “ELAN1” ELAN.

To set the device back to join the “default” ELAN, you must delete the current ELAN (ELAN1). After the current ELAN is deleted, a message is displayed that states that there are no longer any active ELANs. Now, you can move to the ELAN Name: field. Press the **Space Bar**, then the **Return** key. Highlight **SAVE** and press the **Return** key. This will cause the device to join the “default ELAN” again.

Since we support just a single ELAN, you cannot create a new ELAN unless all current ELANs have been deleted.



Future releases will support multiple ELANs. Check your release notes to determine whether your release supports multiple ELANs.

If there are currently no active ELANs, then all choices on the ATM Specific Configuration Screen will result in the message “No ACTIVE ELAN present”. You can only access the Connection Table screen and the LEC Administration screen. You cannot access the LEC Properties screen, since there is no information.

Max MTU Size (Toggle)

The maximum data frame size that this client will use the next time it returns to the Initial State. Use the **Space Bar** to select one of the following choices:

- 1516 (**default**)
- 4544

LAN Type (Toggle)

The data frame format this LEC is using currently. Use the **Space Bar** to select one of the following choices:

- 802.3 (**default**)
- 802.5

LES ATM Address

The LES this client will use the next time it is started in manual configuration mode.

ELAN: (Modifiable)

Selects the ELAN for which attributes are to be displayed.

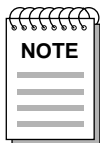
To select another ELAN, use the arrow keys to highlight the **ELAN:** field (bottom left corner of the screen), then press the **Space Bar**.

PORT #: (Toggle)

Selects a specific ATM port.

To select another port (if applicable), use the arrow keys to highlight the **PORT #:** field (bottom left corner of the screen), then press the **Space Bar**.

Adding an ELAN



Remember, while we support just a single ELAN, you cannot create a new ELAN unless all current ELANs have been deleted.

To add an ELAN:

1. Use the arrow keys to highlight **CREATE**, then press the **Return** key.
2. Use the arrow keys to move to the ELAN Name field.

3. Type the name of the ELAN you want to add.
4. Use the arrow keys to move to the Configure LEC, Max MTU Size, and LAN Type fields. Select the appropriate choice for each field.
5. Use the arrow keys to highlight **SAVE**, then press the **Return** key.

The message "SAVED OK" is displayed.

Deleting an ELAN

To delete an ELAN:

1. Use the arrow keys to highlight **DELETE**, then press the **Return** key.

The message "PRESS SAVE TO CONFIRM DELETE" is displayed.

2. Use the arrow keys to highlight **SAVE**, then press the **Return** key.

The message "SAVED OK" is displayed. The ELAN Name field will be updated after you exit the LEC Administration Screen.

Modifying an ELAN

To modify an ELAN:

1. Use the arrow keys to highlight **MODIFY**, then press the **Return** key.
2. Use the arrow keys to move to the field you want to modify.
3. Press the **Space Bar** to modify (select) another option.
4. Use the arrow keys to highlight **SAVE**, then press the **Return** key.

The message "SAVED OK" is displayed.

LEC Properties Screen

The 9A426-01/9A426-02 LEC Properties Screen (Figure 5), displays information about the various LAN Emulation components.

```
SmartSwitch 9000 Local Management

          9A426-02 LEC PROPERTIES

Module Name: 9A426-02          Firmware Revision: 01.00.01
Slot Number: 5                BOOTPROM Revision: 01.01.01

LECS ATM Address: 0000000000000000000000000000000000000000
Configuration Direct VPI/VCI: 0, 0

LEC ATM Address: 0000000000000000000000000000000000000000
ID: 0          State: Initial State

LES ATM Address: 0000000000000000000000000000000000000000
Control Direct VPI/VCI: 0, 0
Control Distribute VPI/VCI: 0, 0

BUS ATM Address: 0000000000000000000000000000000000000000
Multicast Send VPI/VCI: 0, 0
Multicast Forward VPI/VCI: 0, 0

PORT #: 1 ELAN:                                EXIT      RETURN
```

Figure 5. 9A426-01/9A426-02 LEC Properties Screen

LEC Properties Screen Fields

The following information briefly explains each LEC Properties Screen field.

LECS ATM Address

Displays the ATM address of the LECS (if it is known), or the empty string.

LECS Configuration Direct VPI/VCI

A bi-directional, point to point connection set up by the LEC to get configuration information and the ATM address of the LES.

LEC ATM Address

Displays the ATM address of this LEC entry.

LEC ID

Displays the two-byte ID assigned to this LEC by the LES.

LES ATM Address

Displays the LES address for the ELAN of which this client is a member.

LES Control Direct VPI/VCI

A bi-directional, point to point VPI/VCI used by the LEC to issue LE_ARP requests and can be used by the LES to forward LE_ARP replies. This connection is maintained for the duration of the LECs participation in the ELAN.

LES Control Distribute VPI/VCI

An optional point to multi-point, or point to point connection. The LES uses this to forward LE_ARP requests that it cannot process. This connection is maintained for the duration of the LECs participation in the ELAN.

BUS ATM Address

Displays the ATM address of the Broadcast and Unknown Server or LAN Emulation Client whose MAC address is stored in 'leArpMacAddress'.

BUS Multicast Send VPI/VCI

A bi-directional, point to point VPI/VCI used by the LEC to send broadcast, multicast and unknown unicast traffic to the BUS. This connection is maintained for the duration of the LECs participation in the ELAN.

BUS Multicast Forward VPI/VCI

A point to multi-point or a unidirectional point to point VPI/VCI from the BUS to each LEC. It is used by the BUS to forward traffic received from the LECS.

SVC Signalling Screen

The 9A426-01/9A426-02 SVC Signalling Screen (Figure 6), is used to change the type of SVC signalling and LAN Emulation used by the module.

```
SmartSwitch 9000 Local Management

          9A426-02 SVC Signalling

Module Name: 9A426-02          Firmware Revision: 01.00.01
Slot Number: 5                BOOTPROM Revision: 01.01.01

Signalling/LAN Emulation Type: [UNI3.0/LANE1.0]

          ILMI: [ON]

          LEC ATM Address: 0000000000000000000000000000000000000000000000000000000000000000

SAVE   PORT #: 1                                EXIT   RETURN
```

Figure 6. 9A426-01/9A426-02 SVC Signalling Screen

SVC Signalling Screen Fields

The following information briefly explains each SVC Signalling Screen field.

Signalling/LAN Emulation Type (Toggle)

Displays the types of signalling and LAN Emulation to be used by the module. Use the **Space Bar** to select one of the following choices:

- UNI3.1/LANE1.0
- UNI3.0/LANE1.0

ILMI (Toggle)

Enables or disables the Interim Local Management Interface (ILMI) used in UNI signalling. If you disable ILMI, you must enter the LEC ATM Address. Use the **Space Bar** to select one of the following:

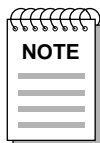
- ILMI ON (**default**)
- ILMI OFF



After you toggle this field, the module reboots automatically.

LEC ATM Address (Modifiable, if ILMI is OFF)

Displays the ATM address of this LEC.



If you disable ILMI (ILMI is OFF), you must manually enter the address of the LEC in this field.

PORT #: (Toggle)

Selects a specific ATM port.

To select another port (if applicable), use the arrow keys to highlight the **PORT #:** field (bottom left corner of the screen), then press the **Space Bar**.

Diagnostics Screen

The 9A426-01/9A426-02 Diagnostics Screen (Figure 7), is used to enable or disable extended diagnostics for the module.

```
SmartSwitch 9000 Local Management

          9A426-02 Diagnostics

Module Name: 9A426-02           Firmware Revision: 01.00.01
Slot Number: 5                 BOOTPROM Revision: 01.01.01

          Extended Diagnostics: [ ENABLED ]

SAVE                               EXIT                               RETURN
```

Figure 7. 9A426-01/9A426-02 Diagnostics Screen

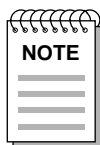
Diagnostics Screen Field

The following information briefly explains the Diagnostics Screen field.

Extended Diagnostics (Toggle)

Enables or disables Extended Diagnostics for the ATM module. Use the **Space Bar** to select one of the following choices:

- **ENABLED** - At start up, Extended Diagnostics test exhaustively all hardware involved with the ATM interfaces.



Enabling Extended Diagnostics increases the module's start-up time by 6 to 7 minutes.

- **DISABLED** - At start up, no Extended Diagnostics testing is performed.

Enabling and Disabling Extended Diagnostics

Use the following procedure to enable or disable Extended Diagnostics (from the 9A426-01/9A426-02 Diagnostics Screen):

1. Use the arrow keys to highlight the **Extended Diagnostics:** field.
2. Press the **Space Bar** to display **ENABLED** or **DISABLED**.
3. Use the arrow keys to highlight **SAVE**, then press the **Return** key.

The enabling / disabling of extended diagnostics will occur the next time the module reboots.

